

CLAIMS:

1. A rotary actuator system comprising:
 - an actuator block;
 - an actuator motor operatively connected to the actuator block for rotating a link;
 - a head mounting block; and
 - a linkage arm comprising:
 - a drive link which is rotated by the actuator motor, having a first end and a second end, the drive link being pivotally connected to the actuator block at the first end and connected to the head mounting block at the second end; and
 - a guide link spaced apart from the drive link, the guide link having a first end and a second end, the guide link being connected to the actuator block at the first end and connected to the head mounting block at the second end.
2. The rotary actuator system of claim 1 in which the drive link is a rigid link being pivotally connected to the head mounting block at the second end.
3. The rotary actuator system of claim 1 in which the guide link is a rigid link being pivotally connected to the actuator block at the first end and pivotally connected to the head mounting block at the second end.
4. The rotary actuator system of claim 1 in which the guide link is a flexible link.

5. The rotary actuator system of claim 1 in which the drive link and the guide link move in a common plane.
6. The rotary actuator system of claim 1 in which a length of the drive link is equal to a length of the guide link.
7. The rotary actuator system of claim 1 in which a length of the drive link is different from a length of the guide link.
8. The rotary actuator system of claim 1 further comprising a ball bearing joint at a pivotal connection between the first end of the drive link and the actuator block.
9. The rotary actuator system of claim 8 further comprising:
 - a ball bearing joint at a connection between the second end of the drive link and the head mounting block;
 - a ball bearing joint at a connection between the first end of the guide link and the actuator block; and
 - a ball bearing joint at a connection between the second end of the guide link and the head mounting block.
10. The rotary actuator system of claim 8 further comprising:
 - a torsion spring at a connection between the second end of the drive link and the head mounting block;
 - a torsion spring at a connection between the first end of the guide link and the actuator block; and
 - a torsion spring at a connection between the second end of the guide link and the head mounting block.

11. The rotary actuator system of claim 8 further comprising:
 - a hinge at a connection between the second end of the drive link and the head mounting block;
 - a hinge at a connection between the first end of the guide link and the actuator block; and
 - a hinge at a connection between the second end of the guide link and the head mounting block.
12. A rotary actuator system comprising:
 - an actuator block;
 - an actuator motor operatively connected to the actuator block for rotating a link;
 - a head mounting block; and
 - a linkage arm comprising a plurality of generally parallel links, each link having a first end and a second end, each link pivotally connected to the actuator block at the first end and pivotally connected to the head mounting block at the second end.
13. The rotary actuator system of claim 12 in which the linkage arm comprises two links of the same length.
14. The rotary actuator system of claim 12 in which the linkage arm comprises two links of different length.
15. The rotary actuator system of claim 12 further comprising a ball bearing joint at each of the pivotal connections between the first ends of each link and the actuator block and the second ends of each link and the head mounting block.

16. The rotary actuator system of claim 12 in which the linkage arm comprises a first link and a second link, the system further comprising a ball bearing joint at the pivotal connection between the first end of the first link and the actuator block.
17. The rotary actuator system of claim 16 further comprising:
 - a torsion spring at the pivotal connection between the second end of the first link and the head mounting block;
 - a torsion spring at the pivotal connection between the first end of the second link and the actuator block; and
 - a torsion spring at the pivotal connection between the second end of the second link and the head mounting block.
18. The rotary actuator system of claim 16 further comprising:
 - a hinge at the pivotal connection between the second end of the first link and the head mounting block;
 - a hinge at the pivotal connection between the first end of the second link and the actuator block; and
 - a hinge at the pivotal connection between the second end of the second link and the head mounting block.
19. A rotary actuator system comprising:
 - an actuator block;
 - an actuator motor operatively connected to the actuator block for rotating a link;
 - a head mounting block; and
 - a linkage arm comprising:
 - a first link, having a first end and a second end, the first end being pivotally connected to the actuator block, and the second

end being pivotally connected to the head mounting block;

and

a second link being generally parallel to the first link, the second link being a spring, the second link having a first end and a second end, the first end being connected to the actuator block, and the second end being connected to the head mounting block.

20. The rotary actuator system of claim 19 further comprising:
a ball bearing joint at the pivotal connection between the first end of the first link and the actuator block.